



TECHNICAL UNIVERSITY OF MOMBASA

Main Paper

Faculty of Applied and Health Sciences

Department of Pure & Applied Sciences

UNIVERSITY EXAMINATION FOR:

BACHELOR OF TECHNOLOGY IN INDUSTRIAL MICROBIOLOGY AND BIOTECHNOLOGY

AAB 4303:PETROLEUM GEOMICROBIOLOGY

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2024

TIME: 2 HOURS

DATE: N/A Dec 2024

Main Paper

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attempt question ONE (Compulsory) and any other TWO questions.

Do not write on the question paper.

Question ONE

- a) Define the following terminologies in the context of Petroleum Geomicrobiology
 - i) Stratigraphy
 - ii) Kerogen
 - iii) Diagenesis
 - iv) Biomarkers
 - v) Petroleum (5 mks)
- b) Describe the factors that cause and direct flow of ocean currents (5 mks)
- c) Enumerate factors that affect the application of microbes in enhanced oil recovery (5 mks)
- d) Enumerate and explain the application of Steno stratigraphic rock dating laws (5 mks)
- e) Carbon cycle is a significant factor in climate variability, explain (5 mks)
- f) Explain the process of crude oil migration in basins and formation of residual tar and shale gas occurrence in in water filled porous source-rocks (5 mks)

Question TWO

- a) Discuss the evidence adduced in organic hydrocarbon s as biomarker signatures of biogenic petroleum origin (10 mks)
- b) Discuss microfossil application in sediment layer age-dating and sea level change indicator (10 mks)

Question THREE

- a) Describe petroleum oil classification and pricing criteria (10 mks)
- b) Discuss the role of fossil assemblage in rock age determination under biostratigraphic approach (10 mks)

Question FOUR

- a) Describe the process of kerogen formation and its potential as a petroleum source (10 mks)
- b) Biogenic process of petroleum formation within sedimentary rocks (10 mks)

Question FIVE

- a) Describe the experimental evidence undertaken Miller and Urey to corroborate occurrence of chemical evolution and origin of life (10 mks)
- b) The chemical evolution on earth that resulted into the origin of early life forms occurred in stages. Discuss (10 mks)